

WHAT IS CLAIMED IS:

1. A dehalogenation treatment method of a halogen-containing flame-retardant resin composition comprising a step of bringing the halogen-containing flame-retardant resin composition into contact with a material mixture containing a dehalogenation material and a dehalogenation promoting material at a temperature lower than a thermal decomposition temperature of the resin composition.

2. A dehalogenation treatment method of a halogen-containing flame-retardant resin composition comprising a step of bringing the halogen-containing non-combustible thermosetting resin composition into contact with a material mixture containing a dehalogenation promoting material capable of decomposing some of chemical bonds of the thermosetting resin and producing resin raw materials and a dehalogenation material at ⁴⁰⁰200°C or higher and a temperature lower than a thermal decomposition temperature of the thermosetting resin composition.

3. The dehalogenation treatment method of a halogen-containing flame-retardant resin composition as set forth in claim 2, wherein the dehalogenation promoting material is at least one substance selected from the group consisting of ethylene glycol, propylene glycol, diethylene glycol, dipropylene glycol, isoprene glycol, triethylene glycol,

tetraethylene glycol, 2-methoxyethanol, 2-ethoxyethanol, 2-dimethoxyethanol, 2-isopropoxyethanol, 2-butoxyethanol, 2-isopentyloxyethanol, 2-hexyloxyethanol, 2-phenoxyethanol, 2-benzyloxyethanol, 1-methoxy-2-propanol, 1-ethoxy-2-propanol, diethylene glycol monomethyl ether, diethylene glycol monoethyl ether, diethylene glycol monobutyl ether, dipropylene glycol monomethyl ether, dipropylene glycol monoethyl ether, triethylene glycol monomethyl ether and tripropylene glycol monomethyl ether, tetralin, biphenyl, naphthalene, 1,4-hydroxynaphthalene, naphthol, 1,4-naphthoquinone, pitch, creosote oil, methyl isobutyl ketone, isophorone, 2-hexanone, 2-heptanone, 4-heptanone, diisobutyl ketone, acetonylacetone, phorone, cyclohexanone, methylcyclohexanone, and acetophenone.

4. A dehalogenation treatment method of a halogen-containing flame-retardant resin composition comprising a step of bringing the halogen-containing non-combustible thermoplastic resin composition into contact with a material mixture containing a dehalogenation promoting material capable of dissolving at least a halogen-containing flame-retardant and a dehalogenation material at a temperature lower than a thermal decomposition temperature of the thermoplastic resin composition.

5. The dehalogenation treatment method of a halogen-containing flame-retardant resin composition as set forth in claim 4, wherein the dehalogenation promoting material is at least one compound selected from the group consisting of methyl chloride, dichloromethane, chloroform, carbon tetrachloride, bromoform, methanol, ethanol, 1-propanol, 2-propanol, 1-butanol, 2-butanol, isobutylalcohol, tert-butylalcohol, phenol, cresol, ethylene glycol, propylene glycol, diethylene glycol, dipropylene glycol, isoprene glycol, triethylene glycol, tetraethylene glycol, diethyl ether, dioxane, tetrahydrofuran, acetone, methyl ethyl ketone, 2-hexanone, 2-methyl-4-pentanone, phorone, isophorone, 2-heptanone, 4-heptanone, diisobutyl ketone, acetonylacetone, cyclohexanone, methylcyclohexanone, acetophenone, acetic acid, acetonitrile, diethylamine, triethylamine, N,N-dimethylformamide, N-methylpyrrolidone, dimethyl sulfoxide, 2-methoxyethanol, 2-ethoxyethanol, 2-dimethoxyethanol, 2-isopropoxyethanol, 2-butoxyethanol, 2-isopentyloxyethanol, 2-hexyloxyethanol, 2-phenoxyethanol, 2-benzyloxyethanol, 1-methoxy-2-propanol, 1-ethoxy-2-propanol, diethylene glycol monomethyl ether, diethylene glycol monoethyl ether, diethylene glycol monobutyl ether, dipropylene glycol monomethyl ether, dipropylene glycol monoethyl ether, triethylene glycol

monomethyl ether, tripropylene glycol monomethyl ether, polyethylene glycol, polypropylene glycol, and tetralin.

6. A dehalogenation treatment method of a halogen-containing flame-retardant resin composition comprising a step of bringing the halogen-containing flame-retardant resin composition into contact with a material mixture containing a dehalogenation material and a dehalogenation promoting material at a temperature lower than the thermal decomposition temperature of the resin composition, by kneading the mixture while applying shear force.

7. The dehalogenation treatment method of a halogen-containing flame-retardant resin composition as set forth in claim 8, wherein the contact by kneading while applying shear force is carried out by a biaxial kneading extruder, a kneader, or rotation rolls.

8. The dehalogenation treatment method of a halogen-containing flame-retardant resin composition as set forth in any one of claims 1 to 7, wherein the dehalogenation material is at least one substance selected from the group consisting of tetralin, sodium hypophosphite, sodium thiosulfate, ascorbic acid, hydrazine, dimide, formic acid, an aldehyde, a saccharide, hydrogen sulfide, lithium, calcium, magnesium, zinc, iron, titanium, aluminum lithium hydride,

lithium hydride, hydrogenated diisobutylaluminum, alcoholic potassium, a metal alkoxide, an amine, and potassium iodide.

9. The dehalogenation treatment method of a halogen-containing flame-retardant resin composition as set forth in any one of claims 1 to 7, wherein the contact of the halogen-containing flame-retardant resin composition with the material mixture is contact with the material mixture in the liquid phase or/and the vapor phase.

10. The dehalogenation treatment method of a halogen-containing flame-retardant resin composition as set forth in any one of claims 1 to 7, wherein the method comprises a step of eliminating oxygen from the contact ambient atmosphere prior to the contact of the halogen-containing flame-retardant resin composition with the material mixture containing the dehalogenation material and the dehalogenation promoting material.

11. The dehalogenation treatment method of a halogen-containing flame-retardant resin composition as set forth in claim 10, wherein the step of eliminating oxygen is a replacement step of replacing the gas of the ambient atmosphere with nitrogen gas by sending nitrogen gas and/or a pressure decrease step of decreasing the pressure by evacuating the gas of the ambient atmosphere by gas discharge.

12. The dehalogenation treatment method of a halogen-containing flame-retardant resin composition as set forth in any one of claims 1 to 7, wherein substances generated by bringing the halogen-containing flame-retardant resin composition into contact with the material mixture containing the dehalogenation material and the dehalogenation promoting material are passed through an alkaline solution.

13. The dehalogenation treatment method of a halogen-containing flame-retardant resin composition as set forth in any one of claims 1 to 7, wherein the halogen composes at least one compound selected from the group consisting of decabromodiphenyl ether, tetrabromobisphenol A, 2,2-bis(4-hydroxy-3,5-dibromophenyl)propane, hexabromobenzene, tris(2,3-dibromopropyl)isocyanurate, 2,2-bis(4-hydroxyethoxy-3,5-dibromophenyl)propane, perfluorocyclodecanethylenebis(pentabromobenzene), ethylene bistetrabromophthalimide, hexabromocyclododecane, a halogen-containing polyphosphate, paraffin chloride, pentabromotoluene, octabromodiphenyl oxide, tetrabromophthalic anhydride, brominated (alkyl)phenol, tris(tribromophenoxy)triazine, brominated polystyrene, octabromotrimethylphenylindane, pentabromobenzyl acrylate, polydibromophenylene oxide, bis(tribromophenoxyethane), tetrabromobisphenol A-epoxy oligomer/polymer,

tetrabromobisphenol A-carbonate oligomer,
tetarabromobisphenol A-bis(2,3-dibromopropyl ether),
tetrabromobisphenol A-bis(allyl ether), and
tetrabromobisphenol S.

14. The dehalogenation treatment method of a
halogen-containing flame-retardant resin composition as set
forth in claim 2 or claim 3, wherein the halogen-containing
flame-retardant resin composition is a printed circuit board
comprising a resin layered lamirate produced by laminating
and molding prepregs each composed of at least a base material
selected at least from the group consisting of a woven or
non-woven fabric of glass fibers, a woven or non-woven fabric
of polyester fibers, a woven or non-woven fabric of nylon fibers,
a woven or non-woven fabric of acrylic fibers, a woven or
non-woven fabric of aramide fibers, paper, mica paper, cotton
cloth, and asbestos and epoxy or phenol resin with which the
base material is impregnated; a conductor pattern formed on
the base material; and electronic parts incorporated into the
base material.

15. The dehalogenation treatment method of a
halogen-containing flame-retardant resin composition as set
forth in claim 4 or claim 5, wherein the halogen-containing
flame-retardant resin composition is a box body of a television,
a display, or a personal computer and the method comprises

a step of pulverizing the box body prior to the contact with the material mixture containing the dehalogenation material and the dehalogenation promoting material.

16. The dehalogenation treatment method of a halogen-containing flame-retardant resin composition as set forth in any one of claims 1 to 5, wherein the halogen-containing flame-retardant resin composition is a composite so composed as to cover a metal wire and brought into contact with the material mixture containing the dehalogenation material and the dehalogenation promoting material to separate the metal.